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Would Like to Meet the Innovators

In July the Academy teamed up with the Channel 4 British Documentary Film Foundation to bring together 15 engineers and 15 documentary makers in an unusual networking session entitled 'Would Like to Meet the Innovators' (WLTM). The event was held at this year's BritDoc 2007 Festival, which took place at Keble College Oxford, and was organised in partnership with the British Computer Society, the Engineering and Physical Sciences Research Council and the Institute of Engineering and Technology. Each organisation invited a number of engineers from a range of different disciplines to take part in the event.

The session provided the attendees with a unique and energetic introduction to the world of filmmaking and engineering. Adopting a 'speed dating' format, each engineer spent five minutes with each documentary filmmaker, before moving onto their next 'date'. The aim of the event was to facilitate potential collaborations and valuable contacts between two creative yet radically different sectors who would not normally meet. Covering a variety of contemporary and engaging topics, such as artificial intelligence, smart materials, climate change and disaster relief, the aim was to create a platform that would act as a catalyst for future documentaries on engineering-related issues.

Feedback from the event showed that the filmmakers were enthralled by the broad scope of engineering, the challenges it faces, and its impact on society. Attending engineers included Microprocessor expert, Professor Steve Furber FREng FRS; Professor Peter Orgrodnik who co-designed the surgical device 'STØRM' (MacRobert award finalist 2007); skeleton bobsleigh racer Iain Roberts, who won an Academy grant towards his PhD research on ice friction and sled mechanics; and RAEng/ EPSRC Research Fellows Dr Eleanor Stride and Dr Karla Miller, whose research focuses on biomedical engineering.

Christo Hird, Chair of the British Documentary Film Foundation said, "WLTM is an essential, effective and entertaining way for filmmakers to meet those with great stories to tell. Every specialist with a passion believes there is a documentary in it; every filmmaker wants to find the subject that no-one else has spotted".

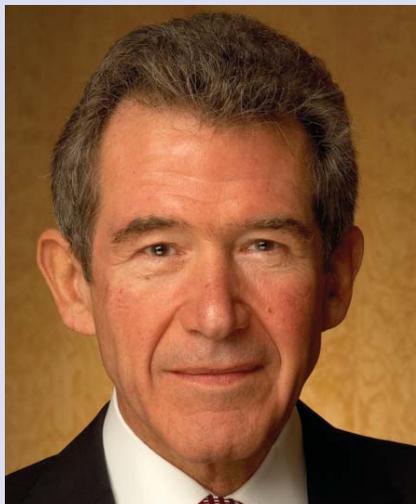
Future evaluations will track the progress of any developments that have been made through this event. For further information visit www.britdoc.org/festival/wltn.php

Contact: lesley.paterson@raeng.org.uk

Speed-Date: PhD student Iain Roberts (Edinburgh University) and Filmmaker Roger Stotesbury (Jump Off The Screen Productions) discuss how to communicate cutting edge innovation to a broadcast audience.



The President's Column



Lord Browne

Demography is destiny. This aphorism has some truth. The fate of nations, political causes, even religions depend in part on the quality and quantity of their adherents. People matter. The Academy can achieve nothing without the commitment of its staff, the participation of its Fellows and the leadership of its Council. In particular, the Academy's future success depends on recruiting new Fellows from the entire spectrum of engineering and who are the elite of the profession.

Yet the most recent review of the Academy's Fellowship makes for uncomfortable reading. Less than 2% of the Fellowship are women. Only 2% of Fellows come from ethnic minorities. The average age of the Fellowship is 69. Few Fellows come from small and medium-sized enterprises. A dwindling proportion of Fellows come from industry. The Fellowship is increasingly unrepresentative of the country at large and of the wider engineering profession.

For these reasons, Council formed a Study Group of Fellows, under Sir Peter Gershon's chairmanship, to conduct a detailed study of the Academy's Fellowship and membership processes. Council approved the Study Group's findings and recommendations in April 2007 and it approved the implementation plan at its meeting in July.

The Study Group looked at the membership process and it identified three principal weaknesses. Firstly, Council has not been directly involved with the strategic management of the process. Accordingly, the Academy does not ensure that its Fellowship appropriately reflects society in its composition. Secondly, with a few important exceptions, there are not enough Fellows actively identifying future candidates for the Fellowship. This matter is too important for an individual to shoulder in the manner of Atlas; it is too important even for a group of Fellows – we all need to play our part. Thirdly, because there are no systematic proactive identification and cultivation activities, nominations are too dependent on those candidates known to Fellows. The Academy almost certainly misses many good candidates.

The implementation plan drawn up by the Study Group to begin to tackle these weaknesses will be implemented over the next 12 months. A booklet explaining the membership process will be issued to all Fellows. The key features of the implementation plan are as follows.

Council will assume strategic direction for the membership process. In particular, it will set out the standards of excellence to be met by candidates and define the overall profile of the Fellowship that the Academy aims to achieve over the next 10 years. The Membership Committee and Panels will remain the guardians of excellence and have ultimate control over which candidates are to be put forward to the Annual General Meeting for election. Additionally, the Proactive Membership Committee will be re-established on a firmer basis with a remit to seek out candidates in those target areas identified by Council. Above all, greater efforts will be made to encourage Fellows to take a full and active part in Academy activities.

We must ensure that the Academy never becomes an organisation simply for like-minded engineers from similar backgrounds. The Academy's purpose is to pursue an agenda that commits it to enhancing national capabilities, recognising excellence, inspiring successive generations of people to take up an engineering career and leading debate. The Academy's success in pursuing these actions depends on the nomination and appointment of Fellows of the highest ability and widest background. Success depends on all of us playing a full part in the Fellowship nominations process. The future health and success of the Academy depend on it.

A handwritten signature in black ink, appearing to read 'J. Browne', written in a cursive style.

Meetings and Visitors

The President has recently met:

HRH The Prince Philip Duke of Edinburgh KG KT
Senior Fellow

John Baxter FREng
President, Institution of Mechanical Engineers

Rt. Hon. John Denham MP
Secretary of State for Innovation, Universities and Skills

Professor David Eastwood
Chief Executive, HEFCE

Mr Syamal Gupta FREng
Chairman, Tata International Limited

AGM 2007

On 4 July, The Royal Aeronautical Society played host to the Academy's 2007 AGM. Chaired by the President Lord Browne, and the Chief Executive Philip Greenish, the meeting was attended by 98 Fellows.

Before moving onto the general business of the AGM, the President welcomed the Fellows and highlighted the most important strategic developments that had occurred within the Academy over the past year. These developments included the 'Engineering for Society' campaign which, along with other leading engineering institutions, the Academy has been making great efforts to move forward.

Move to 3 Carlton House Terrace - update

This will be the last newsletter sent from 29 Great Peter Street, as The Royal Academy of Engineering will be operating from its new centre at 3 Carlton House Terrace from 8 October. Since taking possession of the property we have used the time to carry out some decorating, renew some of the floor coverings, prepare dedicated computer server rooms and to repair some of the essential facilities. This will allow us to operate effectively from the building, and take early advantage of the substantial additional space it provides for meetings, events and exhibitions. We will also be providing dedicated facilities for Fellows, and the move will bring staff together onto the two open plan office floors. This will assist with integration between the different parts of the Academy. Meanwhile, we will continue to develop the design of the master plan, which will enable us to realise the full potential of the site.

During the refurbishment the President, Lord John Browne, took the opportunity to show the Senior Fellow, HRH the Duke of Edinburgh around the building, and to discuss the developing master plan with the architect Stefanie Fischer. During the visit HRH commented favourably on the concepts being proposed and the progress being made.

Moving to Carlton House Terrace provides the opportunity for a step change in Academy effectiveness and visibility; which in turn drives changes in the

Also mentioned was the Academy's drive to engage more effectively with the public and the public policy process; the need to attract more people to a wider range of engineering careers; the work the Academy is making to enhance the role of engineering in UK innovation performance; and the development, both financial, physical and human, of the Academy to increase its impact as an institution.

Two International Fellows, 30 British Fellows and one Honorary Fellow were elected and the Annual Review and the Financial Report and Accounts for the year ended 31 March 2007 were adopted. Changes to Council members were announced (see Council News, page 9).

Contact: ashley.thomas@raeng.org.uk

recognition and value of engineering by society as a whole. The staff look forward to welcoming Fellows and other visitors to the new centre of operations for the Academy at the start of this exciting time.

From 8 October 2007, the full contact details will be:

The Royal Academy of Engineering
3 Carlton House Terrace
London
SW1Y 5DG

Main telephone: 020 7766 0600
Main fax: 020 7930 1549

Direct dial numbers will keep the same last two digits as at 29 Great Peter Street, preceded by: 0207 7766 06xx

Contact: dai.morgan@raeng.org.uk

Below: The Senior Fellow and the Academy President outside 3 Carlton House Terrace



News of Fellows

Dr Chris Elliot has been appointed as non-executive member of the Board of the Office of Rail Regulation.

Cyril Hilsum CBE has been awarded the Royal Society Medal for Applied Science.

Professor Nigel Gilbert has become Specialist Adviser to the House of Commons Home Affairs Committee

Dr David Grant CBE and **Professor Julia King CBE** have been appointed as members of the Technology Strategy Board

Professor Antony Jameson has been awarded the Elmer A Sperry Award for the Advancement of Transportation.

Professor John McWhirter has left QinetiQ in Malvern to take up a position as Distinguished Research Professor in Engineering at Cardiff University.

Professor Tony Ridley CBE has been appointed independent non-executive Chairman of Building Schools for the Future Investments LLP (BSFI).

Sir John Thomas has received the Distinguished Achievement Award from the International Precious Metals Institute.

Professor John Wood has become Imperial's new Faculty of Engineering Principal.

Research News

Emerging Technologies Research Chair

This new Research Chair is designed to attract an outstanding researcher to undertake work at an ultra-precompetitive level. The position would grant the freedom to develop a new area of technology to a stage at which industry could take it forward. The award provides funding for one professorial appointment for a period of up to 10 years in a "blue-skies" research area within the engineering research domain. For full details on this scheme and how to apply, please refer to our webpage: www.raeng.org.uk/research

Research Chairs

Two new Academy Research Chairs have been appointed. These Chairs are full-time professorial appointments in any engineering-related subject, jointly sponsored between the Academy and industry.

Professor Charles E Dickerson has been appointed to the RAEng/BAE Systems Chair of Systems Engineering at Loughborough University. Professor Dickerson has broad-ranging experience in network centric systems, having worked for nearly thirty years in the US defence industry developing complex military systems architectures.

Professor S N Ekkanath-Madathil been appointed RAEng/Rolls-Royce Chair in Power Electronic Systems at The University of Sheffield. Professor Madathil has a long track record in power electronics, and on leaving Cambridge set up the internationally recognised Emerging Technologies Research Centre at De Montfort University in 1995. At Sheffield the emphasis of Professor Madathil's research will be on high power density power electronic devices, particularly for use in harsh environments, such as those found in aerospace applications.

Contact: rob.barrett@raeng.org.uk

Global Research Awards

The Global Research Award provides an opportunity for UK-based engineering researchers to travel overseas on a research secondment for up to one year.

Mr Hristo Kostov of the UK surveillance software company Rinicom plc will work at the St Petersburg Technical University of Aircraft Instrumentation, Russia, to develop an onboard security and surveillance software package called 'Horizon'.

Ms Catherine Manders of the University of Southampton was seconded to Aalborg University, Denmark, for three months to work on research called 'Combining Musculoskeletal and Finite Element Analysis to Assess the Effects of Total Hip Replacement on Hip Joint Biomechanics'.

Mr A Michael Strickland also of the University of Southampton is working on the 'Development of the Kansas Knee Simulator Computational Model' at the University of Kansas, USA. These computer simulations are vital to the development of this key area of orthopaedics and the next generation of knee implants.

Contact: chris.coulter@raeng.org.uk

Research Fellowships

The Royal Academy of Engineering/EPSC Research Fellowships provide funding for exceptional researchers who have up to three years of post-doctoral research experience. The funding is for five years and it is intended to free the researcher to pursue their own individual research programme, unhindered by administrative and teaching responsibilities. The final deadline for applications to this highly prestigious scheme is 23 October 2007. This year, for the first time, all applications should be made on the EPSRC online J-eS System.

Contact: rob.barrett@raeng.org.uk

Distinguished Visiting Fellowships

This prestigious new scheme was launched in April 2007. The scheme aims to enable and strengthen international relations and networking in engineering Higher Education and provides funding to enable academic engineering departments in UK universities to host Distinguished Visiting Fellows from overseas academic centres of excellence for up to one month.

The deadline for the first round of applications was 30 June 2007 at which

Below: Southampton PhD researcher, Mike Strickland, working on the Kansas Knee Simulator.



point 17 awards were made. Thirty five percent of the Distinguished Visitors were from the USA, 18 percent from the Republic of China, 18 percent from Canada and the remainder from Spain, Japan, Israel, India and New Zealand.

The award holders and their organisations are listed below.

Dr Yun Bai

Queen's University Belfast

Dr Kamelia Boodhoo

University of Newcastle

Professor John Burland

Imperial College

Dr Matthew Coop

Imperial College

Dr Zoran Cvetkovic

King's College London

Professor Izzat Darwazeh

University College London

Dr W F Deans and Professor S R Reid

University of Aberdeen

Dr Albert Guillen i Fabregas

University of Cambridge

Professor Simone Hochgreb

University of Cambridge

Professor Robert SH Istepanian

Kingston University

Professor Vladimir Nikora

University of Aberdeen

Dr Hassan Nouri

University of the West of England

Dr Stuart Robson

University College London

Professor Sarah Spurgeon

University of Leicester

Dr D Ian Wilson

University of Cambridge

Dr J Yang

University of Birmingham

Professor Wuqiang Yang

University of Manchester

For more information visit: www.raeng.org.uk/research/researcher/dvdfs/

The deadline for the second round of applications is 31 October 2007.

Contact: imren.markes@raeng.org.uk

Publications Received

The Mullard/Philips Research Laboratories, Redhill – A Short History 1946 - 2002

By Dr John Walling MBE FREng and donated by Terry Doyle, Managing Director of Philips Research Laboratories.

Industrial Secondment Scheme

The Industrial Secondment Scheme provides funding to UK Higher Education institutions to enable engineering academics to spend three to six months in industry with a view to improving the quality and industrial relevance of the teaching of engineering.

Three awards were made in the last three months. The awardees and their host organisations are as follows:

- **Dr Sophie Lo** from Manchester Metropolitan University received an award for a secondment at Garrad Hassan & Partners Limited to work on the modeling of a wide range of wind turbine structural configurations;
- **Professor Zhibing Zhang** from the University of Birmingham received an award for a secondment at Procter & Gamble Technical Services Limited to work on the formulation and production of new detergents in solid powders; and
- **Dr Philippe Duffour** from University College London received an award for a secondment at Ove Arup & Partners Limited to work on the assessment of the vibration isolation performance of railway track systems.

There is no closing date and applications are accepted throughout the year. For more information visit: www.raeng.org.uk/research/univ/secondment/

Contact: imren.markes@raeng.org.uk

International News

Research Exchanges with China and India

As two of the fastest growing economies, China and India are rapidly emerging as important global powers. Engineers have played a key role in contributing towards this economic and social development. The continued sustainable growth is therefore dependent on harnessing the knowledge and skills provided by an expanding engineering base.

Reflecting this, the Academy's International Strategy has identified China and India as

countries of high strategic importance for UK engineering. In recognition of the need to engage with these leading international partners, funding was awarded under the 2004 Spending Review to establish a new scheme in 2007/08: Research Exchanges with China and India.

The objectives of the scheme are to promote collaboration between high quality academic engineering researchers in the UK and China or India, and facilitate the expansion of Networks of Excellence in engineering research.

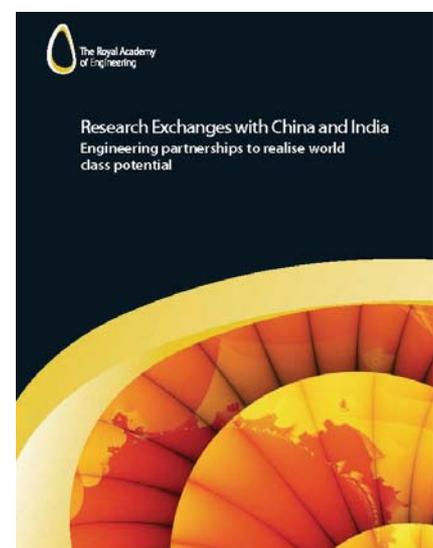
The scheme will provide funding to allow academic engineering researchers at UK Higher Education Institutions to travel to a Chinese or Indian academic Institution. It will also enable academic researchers based in China or India to spend time at a UK institution.

There are two types of award available. Short Awards support visits lasting up to one month. These visits are primarily for networking and exploring joint research projects. Major Awards support visits of three to twelve months and should be part of longer-term efforts to build UK-China/India partnerships.

Applications are welcomed from all areas of engineering research, especially those broadly related to the President's Priorities of **energy and climate change, health and wellbeing, and poverty reduction.**

The deadline for applications is 3 December 2007. For more information visit: www.raeng.org.uk/international

Contact: shafiq.ahmed@raeng.org.uk



Policy News

Statement of Ethical Principles

Engineering is an area that, like medicine, raises a number of difficult ethical issues. Unlike medical ethics, however, engineering ethics are rarely a matter of public debate. On 13 June the Academy held a one-day conference on 'Engineering Ethics in Practice' to discuss the ethical problems encountered by an engineer, and to argue for greater recognition of the ethical aspects of engineering practice.

Under the chairmanship of Chris Earnshaw FREng, the conference began with engineers from a number of sectors talking about how ethical issues arise in their work and how they deal with them. The discussions covered ethical issues in environmental engineering, manufacturing, software development and IT security. Many common themes emerged, such as the conflict between serving the client and the wider public, and the pressure to save money and time versus avoiding risks to society. The discussion proved that engineers need to be prepared to deal with difficult non-technical issues. The afternoon session of the conference involved a workshop on teaching engineering ethics through the use of case studies. The event culminated in the launch of an

Academy and EC^{UK} revised and updated statement of ethical principles. Chaired by Professor John Uff CBE QC FREng, the keynote speakers were Sara Parkin OBE, Director of Forum for the Future and John Armitt CBE FREng. Sara Parkin argued forcefully that engineers have great moral responsibility, especially to the environment, and John Armitt talked about his own experience of dealing with thorny ethical dilemmas.

The events of the conference showed that engineers face many difficult ethical decisions in their working life and that there is a need for guidance, for sharing good practice, and for tutoring students in the area of engineering ethics.

Contact: natasha.mccarthy@raeng.org.uk

Security of Personal Information

With near-constant media attention to the threat of identity theft and online fraud, and the growth of electronic services that handle personal data (online banking, NHS connecting for health), the security of personal information is of great concern. In the light of the recent Academy report, *Dilemmas of Privacy and Surveillance*, a briefing meeting was held on 19 July on how personal data can be protected from snooping and system failure.

Dr Martyn Thomas FREng, a member of the *Dilemmas* working group, discussed the principles for designing large scale IT systems in order to protect the data they process. David Birch, also from the working group, gave a tour of the emerging technologies that can be used to keep electronic information secure. The audience also heard from Dr Kirstie Ball, a member of the group behind the Information Commissioner's report on *The Surveillance Society*, who outlined why protecting personal data is crucial in the current climate. Tom Ilube, Chief Executive of Garlik, the online identity experts, explained how each of us can take control of the information about us that is available on the web.

The briefing demonstrated that protecting one's identity is possible through a mixture of technological solutions, good design and not a little awareness and caution when one is giving away valuable personal details.

Contact: natasha.mccarthy@raeng.org.uk

AI and IT: Where engineering and philosophy meet

Whilst philosophy and engineering are not obvious partners, there is a clear link between the philosophical study of mind and consciousness and research into artificial intelligence. This link was explored at the Philosophy of Engineering seminar held on 11 July, organised in conjunction with the Web Science Research Initiative at Southampton, of which Academy Fellows Sir Tim Berners-Lee, Professor Wendy Hall CBE and Professor Nigel Shadbolt are Directors.

Professor Igor Aleksander FREng looked at the possibilities of constructing conscious machines, exploring the key philosophical question in such a task – what is it to be conscious? Dr Ron Chrisley, Director of the Centre for Research in Cognitive Science in Sussex, analysed how the process of engineering conscious systems – the cycle of design, construction and improvement – might itself illuminate philosophical questions about consciousness. Professor Nigel Shadbolt identified a more novel area where IT and philosophy connect – through the Web. He explained how engineering the potential successor to the

Below: John Uff, Sara Parkin and John Armitt at the 'Engineering Ethics in Practice' conference.



Brian Doherty

World Wide Web – the Semantic Web – is an example of philosophical engineering. In the Semantic Web, data will be classified according to its content, making it easier to collate data on a specific topic from diverse locations on the Web. However, such classification requires a philosophical understanding of content, meaning and classification. This, then, is a new area where philosophy and engineering are natural companions.

Contact: natasha.mccarthy@raeng.org.uk

Renewable Energy-Generation Technologies

In May, the House of Commons Science and Technology Committee announced an inquiry into Renewable Energy-Generation Technologies. Although this is an area that has been covered many times before, the Committee wanted to examine the state of UK-based R&D in the field as well as the Government's role in funding it. Overall funding of energy R&D has been seen to decline significantly since the privatisation of the industry and the break-up of the Central Electricity Generating Board.

The Academy's response took the opportunity to highlight the proposed joint engineering-led study into an optimal route to reducing emissions for energy use. In addition, the response presented the view that R&D in the renewable energy field was fragmented with many projects championing differing technologies on relatively small scales. The scale of individual devices meant that the most significant hurdles lay in the areas of development and deployment where commercial risk became an important consideration. Support of demonstrator programmes, such as are currently being supported in the marine field, were seen as particularly important in reducing risk.

A holistic, roadmap-type of approach was advocated when choosing what projects to fund. Some technologies need to be deployed to create markets even though they might not be the most efficient methods, and it should be accepted that the better technologies will develop to replace the first generation once strong markets for the product have been established. A good example of this can

be seen in the bioethanol market where ethanol from food crops has significant disadvantages compared with lignocellulosic ethanol production, but the development of this technology depends on there being a developed market.

Contact: richard.ploszek@raeng.org.uk

Industry Academia Interactions: Northern Ireland Regional Seminar

To coincide with the Academy's summer Soirée in Belfast, the fifth Regional Seminar in the Industry Academia Interactions series was held on 27 June in collaboration with Queen's University Belfast and Invest NI.

In common with previous seminars, the programme highlighted some of the local success stories, as well as examining some of the hurdles and frustrations faced by small and medium enterprises (SMEs) and academics when working with each other.

Northern Ireland seems to have been more successful than other regions in its use of research centres which can provide direct consulting and testing services to industry, as well as facilitating direct research contact. In particular, QUESTOR, which operates as a research cooperative, showed how mutual benefit can be found in research by large and small companies working with academia. Operating in the environmental sector, QUESTOR found that many high-tech SMEs had potential solutions to the problems of multi-national companies, so a cooperative route to R&D benefited both sides without damaging competitiveness.

Although not absent in other regions, the idea that universities should play a role in actively supporting the local economy through knowledge transfer was very much to the fore.

Contact: richard.ploszek@raeng.org.uk

Draft Climate Change Bill

The Academy submitted responses on the *Draft Climate Change Bill* to both Defra and

the House of Commons Joint Committee on the Draft Climate Change Bill. In addition, Dr Sue Ion OBE FREng gave oral evidence to the Joint Committee on behalf of the Academy.

This important Bill will enshrine in law the Government's target of reducing carbon emissions in the UK by 60% from 1990 levels by 2050. It will also establish a new non-departmental public body, the Committee on Climate Change, to manage the transition to a lower carbon economy.

In its evidence, the Academy was broadly supportive of the aims of the Draft Bill but urged the Government to ensure that adequate engineering input was given to mapping out the trajectory of carbon reductions up to 2050, and also that Government efforts are sufficiently well co-ordinated between the relevant departments. It was noted that the targets are challenging and may, in light of recent scientific evidence, need to be extended further. Technology will be essential in meeting these targets and the expertise and experience of engineers is vital if answers are to be found.

Contact: alan.walker@raeng.org.uk

The Future of Biofuels

On 14 June the Academy held a briefing on 'The Future of Biofuels' which aimed to address a number of the complex issues surrounding the adoption and expansion of biofuels, particularly in the transport sector. The meeting was chaired by Dr Mike Howse OBE FREng and a number of representatives from industry, academia and Government each gave their perspective on the role biofuels will play in our future.

Speakers included Dr Steve Koonin, Chief Scientist of BP, Professor Roland Clift CBE FREng and Sir Howard Dalton FRS, Chief Scientific Advisor for Defra. The event proved extremely popular with over 90 people attending. The high calibre of the speakers, coupled with the increasing controversy of the subject, helped create a stimulating meeting and a lively discussion. Of particular interest throughout were the issues of land use, Government targets, and the potential value of biofuels in road transport.

Contact: alan.walker@raeng.org.uk

Education News

Sir Angus Paton bursary

Balfour Beatty have seen two of their engineering students awarded the annual Sir Angus Paton bursary. The £8,000 scholarship is a prestigious prize for full-time approved Masters degree students whose courses are related to the environment.

Rob Youlten, 27, will use his bursary to pay for an MSc course in Water and Wastewater Engineering. This is a subject that first came to his attention while on secondment from Balfour Beatty in Johannesburg in 2005. During this time he worked for two large collieries, as well as evaluating the stability of a sand sea wall for a diamond mine in Namibia.

Although Rob has worked on interesting projects in the UK, such as at Heathrow Terminal 5, he says that this "is a great opportunity to change direction" after completing four years training to become a Chartered Engineer.

Rob shared an office with the other bursary awardee, Nick Warren, 22, who is using the money to go straight from his civil engineering course into an MSc course in Water and Environmental Engineering at the University of Surrey. Nick has worked on the Oxfam upflow carrier over the past year and is interested in emergency water supply – something into which he wants to do more research during his MSc.

Contact: ian.bowbrick@raeng.org.uk

Ingenia

Autumn 2007 will see further advances in the distribution and readership of the Academy's *Ingenia* magazine.

Until now, the circulation of the magazine has remained at around 5,000 people per issue. Over the past three months, the publications team at the Academy have been researching possible new names to whom *Ingenia* might appeal. Thus, we have targeted young people with a potential future in engineering (such as Year in Industry students), parliamentary figures (such as technology advisors

The Panasonic Trust

This year, six young engineers have been awarded Panasonic Trust Fellowships by the Academy, enabling them to begin MSc courses at UK universities in Environmental Engineering. These students are the latest of the many hundreds to have received funding for part-time masters courses to update their skills since the grant scheme was launched.

Among the talented young people to have won a £8,000 bursary this year, is landscape designer, Fleur Timmer, who has begun an MA in Urban Design at the University of the West of England. Fleur, 27, has her own garden and design business and last year she designed an ecological village for the residents of Barrow Ashton.

Another awardee, Wardere Abdule, 30, has been working with Atkins plc on drainage preparations at the site of the London 2012 Olympics Project. With considerable experience in construction and water distribution networks, Abdule is using his Fellowship to undertake an MSc course in Water and Wastewater Engineering at Cranfield University.

The remaining Fellowship awardees are: Ross Thompson who is going to study Engineering Geology at the University of Leeds; Andrew Iheanaetu who is studying Water and Wastewater Engineering at Cranfield; Ronan Bolton who is doing an Environmental Sustainability MSc at Edinburgh; and Kirk Abbott who is going to the University of Surrey to begin a Water and Environmental Engineering course.

Contact: ian.bowbrick@raeng.org.uk

to government), Deans of engineering institutions, and past and present awardees of a variety of Academy prizes (such as Research Fellowships).

The latest issue was received by some 7,000 readers. While this is impressive, it is hoped that we will be increasing this further over the coming months until we arrive at a number nearing 10,000.

Alongside this rise in printed copies is the launch of a new *Ingenia* website, www.ingenia.org.uk. Launched in early September, this site provides a comprehensive and dynamic reflection of the magazine itself.

Summer Soirée

The 2007 Annual Soirée and Exhibition took place in June at Queen's University Belfast in association with the Irish Academy of Engineering and sponsored by Bombardier Aerospace. Attendees included the Academy President, the President and Vice Chancellor of Queen's University Belfast, the Duke of Abercorn KG (attending on behalf of the Senior Fellow) and Mr Ian Paisley Jnr MLA.

Speaking from his old university, Lord Browne told the guests that today, "Engineering is almost unique amongst the academic disciplines and professions because it empowers you with potential to make a difference". He expressed the Academy's pleasure to be involved in the evening and hoped the guests would enjoy the exhibition.

The Exhibition was entitled *Wealth Creation through Partnerships* and revealed some of the cutting edge engineering research being carried out by the Faculty of Engineering and Physical Sciences at Queen's, as well as highlighting the major partnerships the Faculty has with local, national and international companies.

A particular highlight of the event were the displays of Bombardier Aerospace whose Belfast-based operation manufactures and designs large aircraft structures. Through the exhibition, Bombardier was shown to be an unquestioned centre of excellence for advanced composites.

Contact: amy.abbott@raeng.org.uk

With an HTML and PDF version of 300 articles published, the website will be accessible to all. Articles and features have been cross-referenced with others and many of the articles have links to other relevant external sites.

Contact: dominic.joyeux@raeng.org.uk



Council News

Council held its third meeting of the year on 2 July. Prior to the start of the Council meeting Dr Scott Steedman, Chair of the Communications and Public Engagement Committee, and Academy staff gave a presentation on the work of the Communications Department during the past year.

Sir Peter Gershon, Chair of the Membership Study Group, attended Council to present the plans for implementing the recommendations of the Study Group report. For more details of this implementation plan see the President's Column on page two of this newsletter.

Philip Greenish reported on the status of the move to 3 Carlton House Terrace. At the time of the meeting, the minimum amount of work was being carried out on the building to make it habitable for the Academy to occupy in October. The major work on the building needed to complete the architectural master plan, such as creating a lecture and conference facility in the basement, will be undertaken once sufficient funds have been raised. The assignment of the lease on 29 Great Peter Street to a firm of solicitors has been arranged and the completion date is 15 October 2007.

Mr Greenish reported that a proposal had been sent to the Government for a study in connection with the President's initiative on Energy and Climate Change. There has been an encouraging response which will initially be progressed through detailed staff discussions. In other areas of Government funding, the Academy's submission for funding under the Comprehensive Spending Review CSR2007 has been completed, however the outcome is not expected before October.

Council approved the award of the 2007 International Medal to Professor Xu Kuangdi FEng, President of the Chinese Academy of Engineering.

Council approved the expansion of the Academy's Development resources by the recruitment of an additional three people during the next year. This is in support of the aim of raising £25 million to develop the new building and expand education programmes.

A number of Council members stood down at the AGM, they were Professor Rodney Eatock Taylor, Mr Robert Benaim, Professor Ian Poll, Sir Martin Sweeting and Sir John Taylor. The President thanked them warmly for their support during their time on Council.

Also at the AGM, the President reported that new Council members elected in the postal ballot were: Dr Peter Watson (Mechanical); Mr Terence Hill (Civil); Mr Peter Warry (Electrical); Mr Richard Dodds (Process); and Professor Andrew Hopper (Infomatics).

Contact: ashley.thomas@raeng.org.uk

APEG update

APEG held two important events before Parliament went into recess on 26 July. On 22 May, Dr David Clarke, Head of Technology Strategy at Rolls-Royce, delivered a speech on the theme of 'Powering our future: Rolls-Royce and the environment'. In a fascinating talk about the company's environmental strategy, Dr Clarke reported that between 1998 and 2006, Rolls-Royce had successfully increased its turnover by 59%, while managing to cut its energy consumption by 11% in absolute terms, and reducing its greenhouse gas emissions by 23% over the same period.

On 19 June, APEG held its Annual General Meeting at which elections to the executive committee took place. This was followed by a speech by Malcolm Wicks MP, the then Minister of State for Science and Innovation. Mr Wicks emphasised that engineering played a key role in the economy and that engineers would play a critical part in helping to address the challenge of climate change. With Gordon Brown's accession to the premiership in June, Mr Wicks was made Minister of State for Energy – thus placing him in a key position from which to involve engineers in government policy.

APEG has a full programme of events lined up for the rest of the year, for further details on this programme and more about APEG, please see: www.apeg.org.uk

Development News

Progress continues to be made in developing relationships with potential trust, individual and corporate supporters. The value of connections provided by Fellows is particularly influential.

Funds raised to date earmarked for the Development Appeal have been applied to the acquisition of the lease of 3 Carlton House Terrace – a significant £3 million contribution. Substantial further funds will now be sought to develop the building as *the* forum for engineering, with a goal of £15m. This total now includes provision for VAT, contingency and building cost inflation as the development work can only start once the funds are raised. The capacity for greater public engagement will be particularly exciting.

Funding for educational programmes is also increasing. The Academy's reputation through the Best Programme, London Engineering Project and the forthcoming Engineering Diploma is making its mark. For example E.ON plc is to support the Engineering Leadership Awards event and the Renewable Energy Technology course for undergraduates. Our goal is to continue seeking programme support and to secure the programmes in the long term by building a £10m endowment as part of the campaign.

With the substantial increase in fund-raising goals, the scale of planning and investment has also increased. Following a research study to test our key fund-raising messages, an overall approach strategy for major gifts (£100,000 +) is being mapped out with Sir John Parker FEng, who has been leading the steering group for the last year.

Both Sir John and Lord Browne, President will be closely involved in establishing a campaign committee: a group of individual volunteers who will help raise funds and champion the cause. They will be supported by the Director of Development and an expanded fundraising team to assist with developing the large number of relationships with potential funders necessary for the campaign to succeed.

Contact: sarah.philbrick@raeng.org.uk

Education Programmes

For many years, the Academy has promoted engineering activities in schools and colleges as part of its enduring mission to inspire the next generation of engineers and technicians.

The Best Programme, with its continuum of activities for pupils and students from ages seven to 35, is the backbone of provision to more than 100,000 youngsters every year. More recently, the National Engineering Programme (in its pilot phase as the London Engineering Project), the *Shape the Future* campaign and work with the new 14-19 Engineering Diploma have been added in response to a clear national need for more engineers and technicians.

The Academy is well known for this work, being cited regularly by Government Ministers, by the press, by sister engineering institutions, by industry and by major charitable trusts as a leader in the coordination of engineering activities that enrich and extend the school curriculum. Over 1,000 Young Engineers clubs take place during lunch and after school; whole school days are taken over in celebration of science, technology engineering and maths; summer schools, competitions and challenges exist for budding engineers and work placements are offered within industry for older students.

This work brings the school curriculum alive and challenges pupils to learn more. It places engineers in to schools where they can provide careers advice to pupils who may otherwise struggle to find sufficiently detailed engineering guidance.

Increasingly, the Academy is gaining a reputation for its work with teachers as well as for its work with pupils and students. The *Shape the Future* Steps at Work programme will offer short placements in industry to over a thousand teachers this coming academic year. The Academy also works on the school science, technology, engineering and maths curricula.

To further this aspect of its work, the Academy has recently been awarded a grant through the generosity of the Dulverton Trust for a project entitled: *Uncovering the engineering in school science – a course for teachers*. This will be delivered in partnership with the National Science

Learning Centre at the University of York and the rationale is as follows.

Engineering is a good career choice for young people: it is well paid, well respected and secure. Engineering offers opportunities for work near home or for worldwide travel. Young people can choose the hours they work in order to fit in other commitments like childcare or ongoing education. With engineering skills in such demand in the UK, whether in maintaining and managing current business and infrastructure needs, or addressing known challenges such as climate change, or developing new solutions in areas such as healthcare, young people have a very wide and worthwhile choice. To take a recent quote: "Engineering empowers people to make a difference. Many people dream of changing the world. Engineers actually do so."

The challenge is getting this positive message to many more young people and a quick and effective way is through science teachers.

Engineering is under-pinned by school science. Engineers rely on a good foundation in the laws of physics coupled with an understanding of chemistry and, with increased technology in healthcare, biological studies have become important to engineers. School science teachers deliver this fundamental engineering education, but frequently do so without any real knowledge of actual engineering, what it entails, or where it can take their pupils. In other words, the engineering that is already delivered by the school science curriculum needs to be uncovered.

The funding from the Dulverton Trust will be used to develop a short Continuing Professional Development (CPD) module for teachers, providing them with ways of linking the school science curriculum to engineering. As a result, their pupils will see examples of the relevance of school science, a real-world context will be provided for science learning and science teachers will become more effective advocates for engineering and engineering careers.

Along with the National Science Learning Centre, the Academy will draw together 10 case studies that explain different components of the Key Stage 3 Science curriculum in engineering contexts. The 10 case studies will be introduced in a 55

minute professional development session. This is kept deliberately short so that it may be incorporated as a standard session in a number of Key Stage 3 teacher-development courses delivered by the National Science Learning Centre. In this way, hundreds of teachers will receive the case-studies and the training.

The case-studies will be trialed in the Spring term of 2008 with the goal of reaching more than 500 science teachers over three years. If each teacher uses the materials with eight classes of 30 students, the reach could be 120,000 students. As well as being incorporated into existing CPD courses, this sort of module content will also transfer well to other settings, including existing web-based resource banks.

Contact: matthew.harrison@raeng.org.uk
lynda.mann@raeng.org.uk

Best in show

The BA Festival of Science once again saw the Best Programme representing the Academy as part of the BA Engineering Section's exhibition.

The Festival ran from 9 to 15 September, with the Engineering Section's exhibition taking place on Wednesday 12 September. Hundreds of school pupils visited during the day, proving that the exhibition was a big hit.

Other exhibitors at the Festival included the Learning Grid; Future Flight with their very popular flight simulator; and a virtual roller coaster experience which had 'riders' shrieking with delight.

Below: The completed London Eye construction.



The exhibition's centerpiece was a London Eye construction, which was continuously added to by visitors as the day progressed. Constructed from paper as well as nuts and bolts, the superbly engineered wheel was an almost perfect replica of the real thing, and it moved too!

Contact: claire.mcloughlin@raeng.org.uk

Smiths Partnership STEPS UP

The Academy has teamed up with Smiths Group and the Engineering Development Trust (EDT) in a new education initiative.

Smiths Group is a world leader in the practical application of advanced technologies. Its products and services make the world safer, healthier and more productive. Smiths Group has three divisions focused on the high-growth detection, medical devices, energy and communications markets and employs some 20,000 people in over 50 countries.

The new education initiative, known as Smiths Technology Education Programme (STEP), will help to provide young people, from a wide range of backgrounds, with the information and support they need to explore a career in technology.

There are two parts to STEP, which will run annually. The first sees 20 bright students who are studying maths and science at A-level being offered bursaries, provided by Smiths, to put towards the cost of attending an EDT Headstart course.

Headstart is an engineering education programme run by the EDT, and is part of the Academy's Best Programme. On a Headstart course, first year A-Level students spend up to a week at a UK university exploring science and engineering prior to making their UCAS applications.

After the Headstart course, five of the Headstart alumni that choose to study an engineering-related degree at university, will each be offered a Smiths Technology Award of £1,000 per year for a minimum of three years to help with the cost of their degrees. The bursaries will be administered by The Royal Academy of Engineering and are phase two of STEP.

STEP Student, Shahina Ali, who plans to study mechanical engineering, said,

"The support I am receiving from Smiths will really help with my progression through university and therefore in developing my career. Without it, I may not have been able to go to university at all."

STEP was formally launched at Smiths headquarters in London in September 2007.

Contact: claire.mcloughlin@raeng.org.uk

Students get a head start with the LEP

The London Engineering Project has run its first Headstart course at London Southbank University.

The course, which was unique in that it was for girls only, ran for four days in July and was attended by girls from the London Boroughs of Tower Hamlets and Newham.

During the week, the LEP team and LSBU (London Southbank University) lecturers organised a series of lectures and workshops on different areas of engineering. The students visited the site of the new Keyworth2 building on the campus of LSBU, received guidance about engineering careers and went to see Zaha Hadid's exhibition at the Design Museum. They met several female engineers and role models including Susan Brumpton, Chief Executive of Medical Engineering Research Unit (MERU), who set them a real-life problem to design a hold-all for a wheelchair user.

At the end of the week, the students gave a presentation and they went away knowing that engineering can be as rewarding and well paid a career as a doctor or lawyer. Some may even go on to study engineering at university.

One participant said, "I have thoroughly enjoyed my time at LSBU and I believe I know much more about the university than before. I may even consider applying to this university as I feel it is very welcoming. My views have also changed about engineering in a positive way and I will try to take on board all that I have learnt." Another commented, "An excellent Headstart course. Very interesting and motivating. I would definitely look into a career with an aspect of engineering; especially after this course."

Contact: claire.mcloughlin@raeng.org.uk

TriSET takes off

The Engineering Development Trust's new scheme, TriSET, launched in August 2007. The scheme works in a similar way to one of the more established EDT schemes, The Year in Industry, but targets a younger age group and groups under-represented in engineering. It offers work placements of between six and twelve months to students aged 16 and over.

Set up with funding from the Academy and the Government to organise and deliver a programme of industrial placements in the London Region, TriSET received lots of interest and is now working with some 40 students, 20 of whom attended a one-day seminar at the Academy.

One TriSET student, Linda Igboanugo, commented, "It has always been my dream since childhood to be an engineer. Growing up, I never really had the support I needed to propel myself in the right direction, so coming to know TriSET has given me hope for the future."

Contact: claire.mcloughlin@raeng.org.uk

Obituaries

Sir Robert Davidson FREng died on 1 August. Before retirement he was formerly Chairman, Balfour Beatty Ltd.

Professor Sir Robert Honeycombe FREng FRS died on 14 September. He was Goldsmiths' Professor of Metallurgy Emeritus, University of Cambridge

Professor Peter Ramsdale FREng died on 19 August. At the time of his death he was Director, Peter Ramsdale Ltd, Spectrum Trading Associates and Safe Haven Technologies Ltd.

Mr Bruce Sephton FREng died on 1 June. Before retirement he was Traction Director, Brush Electrical Machines Ltd, Hawker Siddeley Group.

Mr David Shore OBE FREng died on 4 July. Prior to retirement he was Technical Director, APV Holdings plc.

Mr Geoffrey Wood CBE FREng died on the 26 August. Prior to his retirement he was a Senior Partner at Arup.

Events

A selection of forthcoming events. For the full events programme visit www.raeng.org.uk/events

10 October 2007, 6.00pm

Hinton Lecture

Building a world class tube for a world class city

Speaker: David Waboso FEng, Engineering Director, London Underground.

7 Carlton House Terrace, London SW1

Contact: faye.whitnall@raeng.org.uk

5 November 2007, 12.00pm

New Fellows Briefing

3 Carlton House Terrace, London SW1Y

Contact: faye.whitnall@raeng.org.uk

5 November 2007, 7.00pm

New Fellows Dinner

Drapers' Hall, London EC2

Contact: amy.abbott@raeng.org.uk

13 November 2007, 6.00pm

UK Focus for Biomedical Engineering Annual Lecture

Systems Biology and Medicine: From Reactive to Predictive, Personalised, Preventive and Participatory Medicine

Speaker: Dr Leroy Hood, President and co-founder, Institute for Systems Biology, Seattle.

The Royal Society of Medicine, London W1G

Contact: xameerah.malik@raeng.org.uk

10 December 2007, 2.00pm

Engineering and Environmental Ethics A Philosophy of Engineering Seminar

Speakers: Professor Roland Cliff FEng, Professor John O'Neil and Professor Andy Stirling.

3 Carlton House Terrace, London SW1Y

Contact: natasha.mccarthy@raeng.org.uk

14 January 2008, 6.00pm

The President's New Year Reception

3 Carlton House Terrace, London SW1Y

Contact: amy.abbott@raeng.org.uk

Staff News

Kim Bond has left the Academy after two years as a Development Executive to pursue other opportunities.

Dominic Bryan joined the Academy in August as Assistant Manager, Engineering Design Programmes. He graduated in 2006 from Harper Adams University College with a BSc in Design & Development Engineering.

Jacqueline Cox, Assistant Manager, Events has left the Academy to join the events and marketing team at a specialist healthcare publisher based in Berkhamsted, Hertfordshire. Jacqueline has worked in the Academy's Communications department for two years and will be greatly missed.

Brian Doble, Head of Engineering Policy, has retired from the Academy. Brian joined the Fellowship of Engineering in 1991, following a career in Reactor Physics and nuclear plant safety in the CEGB/Nuclear Electric. Since then he has grown the engineering policy activity and before he left he headed a team of four policy advisors.

In addition to the numerous responses to Select Committee inquiries and consultation documents, Academy reports and events, for several years Brian managed the Academy's MacRobert Award when it was a separate charitable trust. His encyclopaedic knowledge of the Academy will, in particular, be one of the qualities to be missed on his departure.

Brian hopes to spend more time working on his photography, from which the Academy has benefited in the past. We wish him and his wife well for their future.

David Foxley retired from the Academy at the end of September after more than thirteen years as custodian of the Visiting Professor (VP) schemes. During

Sylvia Hearn 1946 – 2007

Sylvia Hearn, the Academy's longest serving member of staff, died suddenly on 17 August. Sylvia joined the then Fellowship of Engineering in 1982, as secretary to the Engineering Affairs team covering policy, research and international activities. She absorbed all the technological changes of the past 25 years with aplomb and will be long remembered for her dedication and loyalty to the Academy. As there were no next of kin, Sylvia's funeral was arranged by the Academy and held on 11 September. A large contingent of Academy staff, past and present, was there to pay their last respects.



this time the schemes expanded from the original 'Principles of Engineering Design' to include Sustainable Development, Integrated System Design and most recently Building Engineering Physics. The VP schemes have become established as a well respected Academy brand, with over 160 Academy Visiting Professors in 49 universities, that build a bridge between engineering practice and engineering science.

Xameerah Malik has joined the Academy as Policy Advisor, Engineering Affairs. She has previously worked for the Royal Society of Chemistry and as a research chemist in industry.

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